

AVIATION WEEK

JUNE 2, 1952

A MCGRAW-HILL PUBLICATION

50 CENTS



SALUTE TO THE NEWEST TWIN ENGINE TRANSPORT

That's the Convair 340 you're looking at, Consolidated Vulree's new 44-passenger liner now being delivered to seventeen major airlines.*

With a gross weight of 47,000 pounds, she'll enable these airlines to offer the finest twin engine service in history!

At Honeywell we're rather proud of the fact that every 340 built and to be built will be equipped with our *electronic* fuel measurement system, the *really* dependable fuel gauge found

in so many types of aircraft today. Because of Honeywell's high engineering, research and material standards, Honeywell's electronic fuel gauges have the highest degree of accuracy.

This is only one of many Honeywell products now in use by the aviation industry. We expect the list to grow longer in future years. Because automatic controls are so important to aviation progress. And Honeywell has been the leader in controls for more than 60 years.

*Aeromex de Mexico, S. A.; Aeromex Venezoelana, S. A. (Avenia); Chicago & Southern Air Lines; Compania Mexicana de Aviacion, S. A.; Delta Air Lines; Aero O.Y. French Air Lines; Braniff Airways; Continental Air Lines; Garuda Indonesian Airways; Hawaiian Airlines; National Airlines; Northeast Airlines; Philippine Air Lines; KLM (Royal Dutch Airline); Mid-Continent Airlines; Pioneer Airlines; United Airlines.

AERONAUTICAL DIVISION, MINNEAPOLIS HONEYWELL • MINNEAPOLIS 13, MINN.

Honeywell
Aeronautical Controls



ANOTHER *hytrol* ANTI-SKID BRAKING SYSTEM INSTALLATION

NORTHWEST AIRLINES equips its entire STRATOJET fleet

After nine months and more than two thousand hours of service testing, Northwest Airlines has installed Hytrol-Hydro-Aire's Anti-Skid Braking System on its entire fleet of Boeing Stratojets. This fleet installation again proves the importance that is today attached to the Hytrol System.

Greater plane availability—up to 30 per cent less time wear—reduction of unscheduled tire maintenance—elimination of tire flat spots—decreased landing roll—and the ability for the Hytrol equipped plane to safely land on an icy runway in a shorter distance—are only a few of the factors responsible for the wide acceptance of Hytrol on fighters, transports, and bombers throughout the world.

HYDRO-AIRE
HYDRAULICALLY ASSISTED
ANTI-SKID BRAKING SYSTEM



WHAT NORTHWEST SAYS ABOUT *hytrol*

NO MAINTENANCE
Although Hytrol was checked at regular intervals, it required no maintenance, not a single part of it was changed during the entire evaluation program.

STILL, SHORT STOPPS
Landings made on dry, slick runways indicated that the plane's landing roll with Hytrol compared favorably with landings made on dry concrete runways under ideal conditions without Hytrol. The frozen runway rolls stopped within 50-600 ft. of the CAA certified field length for dry runways.

KIND TO TIRES During the nine month test period, not a single tire was removed for flat spots from the Hytrol equipped Stratojets. Not a single blowout was recorded—and no appreciable scuffing was evident.

New B.F. Goodrich tire is first to meet 250 mph landing test

LANDING PLANE at 230 mph speeds will put a terrific strain on the tires. The plane is heavy. The tires must be used to resist the impact upon it. B. F. Goodrich has set to design a tire which could meet the complete specifications set up by Air Research and Development Command at Wright Air Development Center. The goal of 30 steps in 710 mph on a 450000 lb. aircraft is the toughest ever set for airplane tires. Today's standard tires could not do it. Yet the new B. F. Goodrich tire passed the laboratory test—was well qualified for even more loadings.

After that, the plane was out onto the test run to put load capacity dynamometer tests at low speeds. Car spun for a moment, the tire revealed no sign of failure. At a bank of pushing these tests and meeting all other requirements, the tire won official approval for military production.

New techniques developed for this tire are typical of other B. F. Goodrich tire engineering accomplishments. For example, the first low pressure airplane tire was a B. F. Goodrich development. And the first high pressure tires were built by B. F. Goodrich.

Along with this latest accomplishment, BFG engineers have brought new improvements in their complete line of vehicle, military and light plane tires. For complete information on tires, brakes and wheel assemblies, tire liners, wheel rollers, valve assemblies, and other B. F. Goodrich products for aviation, write The B. F. Goodrich Company, Akron, Ohio.

B.F. Goodrich
FIRST IN RUBBER

Rudder Pedal Adjustment

AIRBORNE actuated



An R-622MI actuator and two R-131 jack screws, connected with flexible shafting, comprise the rudder pedal adjusting system on one of the latest fighter planes.

Long association with the industry and wide experience in the design and development of electro-mechanical equipment for aircraft enable us to meet the rigid requirements of such an application. Let us help you with your problem, too. See our data in the L.A.S. Aeronautical Engineering Catalog.



ACCESSORIES CORPORATION

1614 Chestnut Avenue, Middle E. New Jersey

AVIATION CALENDAR

June 13—Airport lighting conference and seminar, sponsored by American Association of Airport Executives, Double-Walsh Hotel, Columbus, Ohio

June 18th—Society of Automotive Engineers
concurrent meeting, Ambassador and Ritz
Carlton Hotels, Atlantic City, N. J.

June 3—Council for military aircraft standards, Aircraft Industries Assn., meeting Hotel Statler, New York

June 4-5—California Association of Airport Executives & California Aviation Trades
AIAA conference, Redwood, Calif.

June 9-13—National Fire Protection Assn. annual meeting, various sessions on June 12, Hotel Statler, New York

June 15-19—American Society of Mechanical Engineers: 10th annual meeting, Sheraton Gibson Hotel, Cincinnati

June 16-17—Arleton Distributors and Mrs. Vincent's Ann and your meeting, The Grand Hotel, Michigan Is., Michigan

June 1518—Aircraft Trade Show opens
total exhibit of aircraft parts and equip-
ment, Hotel Fort St. George, New York.

June 1921.—American Society of Mechanical Engineers, symposium on shock and vibration instrumentation, Pennsylvania State College, Pa.

June 23-27—American Society for Testing
Materials 55th anniversary meeting, Bal-
leu and New York Hotels, New York.

June 26-28—Ignition and engine system conference, sponsored by Seafield Mag netic division, Bendix Aviation Corp., Solon, N. Y.

July 13—American Microbiological Society national meeting, including joint session with the Institute of the Neurochemical Sciences, Hotel Statler, Buffalo, N. Y.

July 4-B. Murry Nunn, all seasons (constant)
 (mended) on river from South Ast, Calif.,
 to Yreka, N. J.

July 2-12—Aurora Waters Ann. annual convention, Ambassador Hotel, Los Angeles.

July 18. History of the Astronomical Society annual meeting, LAG Western Headquarters Building, Los

July 18-19—Women Flyers of America annual convention, Chattanooga, Tenn.

Sept. 1-7—Society of British Aircraft Constructors annual display, Farnborough, England.

Sept. 15-19—International Air Transport
Assn eighth annual general meeting,
Geneva, Switzerland.

PICTURE CREDITS

4.—Bill Albrecht, 5.—Basing, 12.—Wife Ward, 14.—Lambert 15.—EKA, 17.—Pawnee, 18.—Harpur Corp., 19.—Aero Corp., 20.—J. A. A. 21.—Nagelbe Aviation Corp., 22.—James Harrison, 23.—Edward Levy, 24.—McGraw-Hill World News

Mind Your A's & B's on Stratojets



BOEING B 47E in flight displays the large, bolding, arrowed fuel gauges characteristic of this latest production version of the 600-sq-ft-plus Stratoplane medium bomber.



8-03A NINE CLONE is usually not fully transgenic except for small central disk having some flowers, others sterile.



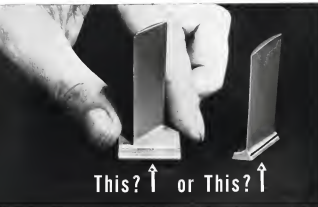
♂ 478 NOSE CUNE is more 'whiff' with sculpin provided by smaller snout-type parula behind large nose plate.

E-CIA YAE features a pronounced curve visible on top fls, vertical rather than horizontal tail fining ends at middle & trailing edge. The staves . . .

3-CH TAIL can be spatted because top is flattened out and horizontal surface's living extends beyond rabbit.



Which One Will Save a Million Dollars?



Three years in the making, the fabricated jet engine compressor rotor blade (left) promises to save the armed forces not just one million, but millions of dollars annually in jet engine costs, compared with the forged blade (right). This new G-E development will cut manufacturing cost in half and save over a third in critical materials. Military approval has been received for the use of fabricated blades in the General Electric J47-DB-33 which powers the Boeing B-43 Starliner bomber. And G-E, through the United States Air Force, is sharing the process with other major jet engine makers.

The blades are rolled in long strips, contoured to the proper air flow, and cut to desired length. Each blade is then welded into a separate base which fits the same

area on the "blade ring" used with forged blades. Thus the ring and its expensive manufacturing and assembly process have been eliminated.

Endurance tests on two engines equipped with the fabricated blades proved these just as efficient as forged blades. The base provides greater resistance to vibration due to unsteady airflow through the compressor. Damage caused by foreign objects entering the compressor is minimized because the new blade is fastened much more strongly to the casing.

A product of G-E research at the Thomson Laboratory in Lynn, Mass., this new method of manufacturing rotor blades is another of the many ways in which G-E is constantly pioneering contributions to the advancement of aviation. General Electric, Schenectady 5, N.Y.

You can put your confidence in...

GENERAL ELECTRIC

WHO'S WHERE

In The Front Office

E. A. Pratt has been named chairman of the board and **H. E. Valasek** made president of The Sperry Corp., N.Y., succeeding **Thomas A. Morgan** who previously held both positions. In other Sperry changes, **John Sullivan** has been designated senior vice president-in-charge, **C. M. Green**, vice president-in-charge of Sperry Gyroscope Co. and **Kenneth Brunsen**, vice president-in-charge of Videx, Inc., have also been made vice presidents of Sperry. **William Magg**, previously senior vice president and assistant manager at Vought Corp., Chicago, Ill., has been named senior vice president-in-charge for the firm. New senior manager is **Ray O. Scheibel**, Jr., formerly Lockheed manager.

Changes

Harold Johnson, formerly chief sales manager of Weber Aircraft Corp., Indianapolis, Ind., has been promoted to product development manager, a newly created post. **Gene H. Miller**, professor of aeronautics at Massachusetts Institute of Technology, has been appointed director of engineering at Kansas Aircraft Corp., Wichita, Kan.

George D. Ray has been named chief of preliminary design for Bell Aircraft Corp., Buffalo, N.Y. **Leslie Ross** (also now Ray) formerly post as chief research engineer and **Arthur Schmidt** has been named Ray's assistant.

E. C. Sterling, Jr., has been appointed western division sales manager for Cessna Aircraft Co., Los Angeles, recently merged with Tenthredin Co., replacing **R. H. Shaw**, resigned.

R. E. Serfaty has been named assistant director of engineering at Allison Div. of General Motors, Indianapolis.

George H. Bennett has been made sales representative of Cessna Aircraft Corp. at the newly formed district office of the city division's sales and service department. He will leave in Wichita.

C. A. Hoffman has been named to the new position at production superintendent at Lockheed Aircraft Co. Inc., Burbank. **Kenneth J. McKinnon** has replaced **Thomas Hall** as acting sales and service manager for Bell Aircraft.

Charles G. McInerney, Jr., has been appointed advertising manager for Pan American World Airways.

G. S. Heston has been named systems manager, Alouette program, Space Canada Air Lines, succeeding **F. M. McCarty**, resigned.

Edwin Zak is a new representative at headquarters in Toronto, World Airtel in Paris, replacing **J. T. Davis** who is returning to Kansas City for special assignment. **R. E. Connolly** succeeds Zak's former K.C. district.

E. L. Morse has been designated engineering director of New Industries Technology, Inc., West Coast Division, Oakland, succeeding **E. S. Longmire**, resigned. **G. K. Fausch** has been appointed director of training.

INDUSTRY OBSERVER

(The following columns are based on the foreign observations of an Aviation Week editor reporting from London, Frankfurt and Paris.)

► The era of 30,000 h.p. thrust jet engines apparently is here, little noticed and unexciting. Borealis's Olympus is well over that figure. European authors such as *Aviation Week* and *Whitney* 117 is reaching 30,000 h.p. and the American Siddeley-Singer's 117 is just over that point. Siddeley-Singer's ATAR 101E, still under development, is expected to attain the same rating, and in Sweden Svenska Flygmotor is testing a very high powered jet. Air Force officers in Germany are even the Alouette engine in the F-4H (which they call the J74-37) develops 7,900 h.p. thrust, and that is a fairly old engine.

► U.S. air aid to Yugoslavia is in the form of F-47s, plus technical assistance in training ground crew. We get no lines on what powers in return. Yugoslavia will fight only if Yugoslavia is involved. We are not sure that Tito will act on his hands in case of a Russian push through Germany toward France.

► Decals in the hangar-at program. Freight charges on planes shipped abroad in U.S. ships are paid by U.S. If planes are shipped in foreign boats, country receiving the planes must pay, and in dollars. Recently the Dutch were holding a batch of F-54s destined for the Dutch because the Dutch were protesting the \$7,000 per plane bill.

► European isn't really selling on U.S. for aircraft. Denmark has ordered 11 NF-16. Mexico all weather fighters from American Sikorski Night and all weather fighters are the greatest lack in Europe in air defenses and the Mexican, despite known deficiencies, at least is visible.

► Unpublished aspect of the fuel shortage. USAF planes in Europe have been out for 37 to 40 flying hours a month in order to conserve the strategic reserve of fuel. Special mission flights have been all but eliminated. Even the combat planes in Berlin were downgraded for a week, then one flight a week was restored in place of the usual three.

► Although plane call for Messier-Bugatti's Motore production to be financed by MDAP funds (Aviation Week May 26, p. 13), Messier plane fabrication has already started at MD's Frankfurt plant.

► Rumors over German inflation will not be named Deutsche Luftfahrt (Aviation Week May 26, p. 21), has many former employees of Luft have not still stay and in Germany. Most of them, particularly the pilots, are too old to go back to work for the new side, but would be able to claim pensions if the new company was a continuation of Luftfahrt. Allied advisors to the German government have suggested that the Deutsche Luftfahrt company largely be dissolved.

► While U.S. sources claim that VASP, Brazilian firm in ordering some SAAB 3700s two-engine transport. Swedish information claims that SAAB has abandoned the license. The company is now to find an uncommitted place on longer can compete, maybe, the Swedish government must permit SAAB to use new and obsolete on civilian work.

► British Overseas Airways Corp. and de Havilland apparently have abandoned the project to use the Sprite rocket engine on the Comet for "General Aviation" at high altitudes at high altitudes. BOWAC is contemplating the new and with water-methanol injection in the DH Comet engine, without the weight penalty that would be incurred by using the Sprite. The rocket engines originally were to be installed in the wing trailing edges between the pass in Comet transports.

► Since reduction of the traffic potential the new German air base will be able to tip a shown by three signs: in 1994, the two engine of the base in Western Germany handled 1,000,000 passengers.

► British Overseas Airways Corp. has been planning a 50-passenger two-engine, twin-aisle craft carrying of about 100 mph, and able to do the London Paris (air travel) run in 1.4 hr. It would have a 20 ft wingspan so the motor could be installed for greater speed. Estimated service date: 1960.

Washington Roundup

Aviation's Inconsistency

Aviation industry has allocated more key funds on Capital Hill when it may need them the most: losses on defense business fell up to two to three years—leaving a major loss.

Reason: The industry's inconsistency in commercial aircraft development policy. Both as transport and as combat, developing lines panned losses one side of the fence to another in a few years, and, all important from the congressional relations point of view, have overlooked the business of keeping windows peered on its sliding picture.

The network: Representatives and Senators carrying the banner for the industry have looked around and, with surprise and embarrassment, found the industry would be behind them—but lead up against them. Some facts from the record.

• **Days of Need:** In the 1940-45 postwar slump period, aircraft manufacturers and airlines pleaded with Congress to foster government financing of up-to-date commercial prototypes.

On a monetary authorizing the government to put up the cash to stimulate commercial production, industry spokesmen testified.

• **Albert E. Lombardi,** military sales manager Consolidated Vultee Corp. "The principle captured is that bill are sound. We feel the bill if enacted and supported by suitable appropriations, will benefit the nation through improved civil air transport and through strengthened national defense."

• **Robert J. Thompson,** executive vice president, Air Transport Asia. "The U.S. is present predicament among the world's most important and important in air travel in that legislation. Since the air transport is clearly the transport of tomorrow, we may well feel ourselves a few years hence, long the transport market. And just as we will if a bill like this is not passed, because the manufacturers and airlines also cannot undergo the economic expense involved in financing the development."

• **Less Needs—Emergency needed though it was,** the Republic-controlled Congress acted within a hour's hour of passing the proposal in mid-1945. Reason: it failed but aircraft production in aircraft manufacturing, by then getting in major clut of industry houses under the 78 group Air Force bill.

• **Minor's Sin:** Given authority, Senate chairman of the Joint Congressional Aviation Policy Study, noted.

"They come to me but in hand and begged us to do something to get them going. And we got things going. Then they changed their minds but they didn't tell me about it. I was not in the situation continuing to labor for this objective, and actually they subverted me. I think it was a very discreditable episode. . . . I think the best they could have done is to drop out and say 'We have changed our minds.' Smart aviation began to appear—when we were fighting and didn't know what we were going to. It was important and very useful."

• **N's Next—Finally,** a law (now 804, AFA) decided it, too, was against a government program for commercial plane development.

But Rep. Carl Hinton and other Representatives and Senators, still pushing legislation in Congress, only found out about the commercial through the medium of the press.

New Koiser Investigation?

Most is in for a full-fledged congressional investigation of radiomaster theory. Koiser-in-the-forefront, his contracts with the Air Force for cargo plane production at Willow Run. House Armed Services Committee is looking into the matter.

Rep. Allen O'Connor, in a floor speech, said: "Production records. So far, Kaiser-Frazer Corp. has only accounted for a Ford Model C-119 at Willow Run. 'All parts for this plane were actually made at the Haggenwies, Md. plant of Packard Engineering and Airplane Corp. Kaiser-Frazer just bought the parts, shipped them nearly 1,000 mi., merely assembled them at Willow Run.' (O'Connor's note: This is a common aircraft manufacturing procedure for testing assembly line workers.)

Although the firm has not yet come into production in its contract for 150 C-119s, O'Connor has called out its extension to the Matthews plant to avoid a contract to Kaiser-Frazer for an additional 250.

• **Waste of tax money?** Cost to USAF on C-119s will be three, to four times as high as the Packard Haggenwies plant, O'Connor declared. Packard can turn out the plane for less, \$500,000 to \$550,000 there, and "when it was suggested that strategic distribution was the object other than price, Packard offered to produce the plane in Chicago at the same low price." Price from Kaiser \$600,000 to \$1,000,000.

• **Extensive endorsement:** In the debatement of the first C-119 "assembled" at Willow Run, Kaiser-Frazer "lavish, extensive" USAF procurement officials and press in a "past endorsement" at taxpayer expense, the Wisconsin representative charged.

• **Business by influence:** "Kaiser-Frazer to each dollar dollar simply by placing his own key in proper departments of the government."

• **Names—These men were named by O'Connor:**

• **James Underkuffler** of Air John McCone. "While Underkuffler is not a member of the board, he has been in position of president of Packard Model Corp. The Packard family happens . . . to be holders of 4,100 shares of Kaiser-Frazer common stock. . . . McCone paid Kaiser \$1 million for Air Force order for building 118 Packard planes."

• **Clay Riddle** "lost a lot of money as vice president of Kaiser-Frazer to become involved in defense Mobilize two districts, Charles Wilson . . . and still have special assistant to the Secretary of Defense." New Bedford is president of Kaiser's Chase Aircraft Corp.

• **Warren Hall** "took a leave of absence as purchasing agent of Kaiser-Frazer" to become involved in the administration of Defense Production Administration.

• **Kaiser's Claimant:** Rep. O'Connor has not only been personally involved . . . but has apparently been in consultation with persons willing to damage the Kaiser-Frazer corporation that (a) that to make his position and statements statements under the cloak of congressional immunity, so that he could make the records without any checks as to the truth.

"The Kaiser interests welcome on over all congressional hearing, and would further hope that Rep. O'Connor would be a member of the committee, so that he could answer to his constituents, his colleagues, and the people, the source of his information, and the reason he felt justified in making these statements without any checks."

—Katherine Johnson

AVIATION WEEK

Treaty Spurs New German Air Industry

- **Rebuilt plants seem aid to European rearmament.**
- **But technical poverty may mean long delay.**

By William Kroege

Frankfurt-A. might, new aircraft production machine to add U.S. efforts to drive Russian aggression toward the first test run of the last test.

Signing at Bonn of the German peace contracts with the West made it possible for the once-powdered, technically efficient and creative German aircraft industry to come out from under the yoke and openly plan the rebirth of German aircraft manufacture. But the start will be small, and for a long time limited contributions to the West's rearmament will be made.

Important to U.S. officials here, who have been seeking ways to turn Germany's industrial capacity to the job of supplying Europe's defense, is the fact the new status of Western Germany under the peace contracts will legalize these secret hopes.

Little can be done fairly until the reduction of the contract control by the limitation of the contract control. But working in front of speed action on German aviation are these factors:

- **Immediate need for spare parts** by the Air Force in Europe for C-47 and C-54 transports. Lead time is too long to buy the parts in the States, and there is a shortage there, too.
- **British fleet** that present high-level German civilian production will destroy Britain's export trade.
- **Less security production** in Britain and France (and also in the U.S.) when increased spread the need for planes by Japan, as Soviet, and Germany's presence of manpower, materials and plants.

But there are some long-drawn-out factors:

- **Technical reasons:** Germany standing from after destruction of Germany's research and technical facilities after the war.
- **Strategic considerations** which now debate spread of large-scale plants as opponent contracts in Germany.
- **Political factors** both in and out of Germany, with France usually favoring a revised Germany and with Ger-



FROM RUINS such as the Heinkel plant at Rostock, German plane builders start again.

man industrialists themselves reluctant to turn from peace to war goods.

In spite of all those non-canons, definite progress can be expected even this early.

German aviation is starting to rebuild as a familiar aviation with planes Two firms in Germany are producing industrial, that are plans to find other industries of the "backyard" industry—birth north in the Western Zone. At least one German plant is making spare parts for USAF planes several other plants are manufacturing electronic and optical equipment.

• **Aviation Priority:** But the technical need is serious.

In all of Western Germany today, says as observer is a political issue, there is but one complete set of National Advisory Committee for Aeronautics reports. There is no German aircraft industry. The Poles-Wall factory based on based on during World War II for its designs, is building a glider with an actual service 15 years old.

After World War II, Germany was swept clean of aircraft manufacturing and kept clean in perhaps the most thorough technological vacuum in history. Even considering that German planes were designed so late as 1944 it has been eight years since any Ger-

man worked with aeronautical research facilities in Germany.

• **The Big Names:** So today, Germany's only associated design strength has been the simple fact that the Allies could not occupy clear the roads of Heinkel, Fiesler, Messerschmitt, Pöschel and the scores of other top-flight engineers who are still living in Germany. The new and secret nature of their work could be jeopardized with ideas to be developed when the time is right.

Defeat and occupation did not stamp out the German desire to fly. Just a year ago, when gliding was permitted, gliders were dug out of basements and barn lofts as a means of flight in Western Germany. Their owners said they had been built before during the war. An American anti-aircraft engineer who examined most of them believed otherwise.

There is another possible source of German technical knowledge—the German scientists who have been working with the U.S. and British governments. Whether they want or could be persuaded to return to Germany to rebuild the aircraft industry is a different question.

• **Prospect:** An understanding of the prospects for a revised German aircraft industry must be reached by an understanding of some of the political, mili-

ably be satisfied in 1954. First of the persons in the program are due to come through in 1955. Effect of finding substantial foreign capacity for castings, it is hoped, will be to speed the study along.

Pressures on Dies—On the hydraulic press forming the dies are subject only to flexing and flow pressures. But in hammer forging, the dies are subjected to impact as well as flexing and flow pressures. This additional impact pressure cuts the life of the dies and thus increases the cost of this method of forging.

[A two-way or crossflow furnace for ferritic castles is being used by the Lathrop Co., Milwaukee, in which two runs come together, causing plastic deformation at a slower rate than in one-run furnaces. However, this principle has not yet been applied to aluminum forging in this country, as far as has been disclosed.]

Air Force Position On Jet Transports

Air Force has long been antagonistic toward legislation authorizing a government-financed program to spur development of new commercial aircraft types—but it's trouble about being around at home, so.

This is the latest example of USAF's attitude.

* On May 9, in an official communication, cleared by Budget Bureau and signed by Assistant Air Secretary F. D. Higgins, USAF went on record as saying postponement of such legislation. Partial excerpts from the Higgins letter:

"At the present time such legislation goes contrary to the Department of Defense because of the possibility of diverting of the nation's industry's capacity for research, development, and production during the present period of military expansion. As long as the present critical requirements for research and engineering, materials, and facilities exist, any program such as contemplated may seriously affect the present programs of the Department of Defense.

In view of the foregoing, it is the opinion of the department that consolidation should be continued.

"This report has been coordinated using the departments and boards of the Department of Defense in accordance with procedures prescribed by the Secretary of Defense."

• On May 13, Sen. Pat McCarran

Initiating, defining the Scientific Institute and Planning Committee Commission, chaired USAP for funding "no interest in the development of a jet transport for light transport that would cut the cost of the aircraft by 10-15% compared to the Korea to the U.S. from 16 to 18 tons. The idea persists that a military transport is supposed to be slow."

• Three days later, USAP's Undersecretary for Policy and Planning, "discussions" interrupted in some quarters as a reversal of the military position and support for commercial jet development. He said: "It is my impression that the position of the Department of Defense is that it is not possible to develop a jet transport that is a suitable foreign prototype jet transport development at any time that it can be carried on without interference with the virtually important and

"Assuming that such information is available under existing circumstances, it is my personal belief that steps looking toward the development of suitable jet transports for civil aviation could be initiated at this time."

But, as stated in the Haggas letter, Defense Department has assumed that there would be no such interference.

- The Harpers statement is "official"
 - Gilpatric is a "personal" opinion
- Furthermore, Gilpatric makes it clear that a component of the program "should not be justified on the basis of military necessity." And it's generally presumed that this is the main basis on which Congress would ever approve such a program.



HEADGEAR STYLE NOTE

new type headlamp with four round new wavy well-defined Lookhead tail plates is added (left) by Robert Stevie. Glass C. Calhoun wears the old style gas. The hood below, designed by Lookhead Light of England, J. H. Mayfield, is customized to pilot's head measurements. Movable plastic rear shield face and oxygen regulator, filter ultraviolet glass at high intensities. Program can be used by lifting head on level of helmet.

ODM Sets Up New Advisory Committee

Washington, vision observers last week learned that the Office of Defense Mobilization's new Advisory Committee on Production Equipment still would depend heavily on Defense Secretary Robert Lovett for its initial power, although the committee was named from the Defense Department to CICA.

Speculation was that the men named to the committee would not continue to serve unless they felt was their advisory status was directly effective in meeting requirements of the Defense Department.

The committee was set up by ODDM to take the place of Defense's Production Policy Advisory Commission (Av-

► **On Committee**—Dr. John Streibman, acting ODOM director and assistant to President Truman, notified Lowitt

"Since the new group can perform most of the functions which we had originally planned for the Production Policy Advisory Commission it will not be necessary to complete the establishment of that group."

Actually, the ODM committee took over the personnel selected for the earlier commission and includes Harold Vance, chairman and president of Shred-Lite Corp., chairman, Clay Bedford, president of Chase Aircraft, Inc., Mervyn DeBuschman, retired DPA Administrator, and Lt. Gen. K. B. Wolfe, Retiree, USAF Deputy Chief of Staff. Maj. Charles Smithfuchs, ODM staff director, who had been secretary of the shared-risk committee, will fill the same job for the committee.

Next, to be sure there was no mistake about who was being, Dr. Strickland issued another order creating an Intergovernmental Commission on Production Policy, headed by the DPA Administrator. This post is to be filled by Henry Fowler who also is presently serving as NPA Administrator.

What It Means—Strickman's order provided that Vane's ACEP "shall function as a subcommittee of the Interagency Committee on Production Policy," where permissible its members would advise the members of the 11 agencies named as committee members, and other agency members participating in deliberations affecting these agencies' interests.

And what did it all mean?

Animation industry observers saw it mainly as a struggle between opposing official powers for defense production contracts, and a move to get these contracts back to ODM and DPA, countering Defense Department's effort to subordinate them to the commission it looked up to: Stockholm, with President Truman's backing, had won.

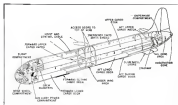
Munitions Board Report on Prime Contracts

Two firms participating in the U. S. military weapons program have received \$11.5 billion in defense contracts—or 26.2% of the total dollar volume of defense business since the outbreak of war in Korea.

They are, in order of rank as to the volume of defense work: General Motors Corp., United Aircraft Corp., Douglas Aircraft Co., General Electric Co., Lockheed Aircraft Corp., Boeing Airplane Co., Chrysler Corp., Grumman Aircraft Engineering Corp., North American Aviation, Republic Aviation Corp.

Following its aviation concerns, signing is Member Board's report on the 100 companies making highest volume of military prime contracts received from July 1950, through December 1957.

[illegible]



CUTAWAY showing doors open and access ports to various compartments.

XC-99 Sets Air Cargo Records

In the past two months one USAF airplane has flown approximately 3 million two miles carrying equipment and supplies, nearly half of which came in direct support work in the Kansas state.

In accomplishing this herculean task, the airplane, the only one of its kind and the largest experimental aircraft in the world—the Convair XC-99—has flown nearly 680 hr. and has airlifted approximately 7 million lb. of cargo. It has made over 60 long flights of more than 1,500 mi each, and more 10 flights under 1,500 mi. Direct flight tests of the airplane are quoted at less than 1 cent a ton-mile.

Test Operations—Data on this unusual cargo operation, conducted by the Santa Ana National Aeronautics, headed by Maj. Gen. C. W. McMillan, has been made available to the Western World as a report on the evolution of SAMBA in conducting out of its Kelly AFB, Tex., headquarters.

Claims are that there will never be another XC-99, but C-57A aspects in supply lines increased from its experience to development of other big (300,000-lb. payload) long-range transport aircraft of the near future. And on the basis of data closely learned, it appears clear that more powerful, heavier, higher-speed military transports of this capacity may pay big dividends in efficiency.

The six-engine XC-99 made its first flight at San Diego in November, 1947, and was accepted by USAF May 28, 1948. It later was refitted with Whop Major powerplants, R4350-41 version rated at 1,500 hp., at Kelly AFB. On Sept. 6, 1950, it began its operational evaluation program.

State of R-46—Col. Theodore W. Tucker, deputy for operations at

SANAA, was named project officer and chief pilot of the evaluation because of his earlier experience as a pilot of the transport's prototype, the Convair B-36 bomber.

Before the project started, the plane had made a cargo record when it was fitted in a truck cargo load of 101,266 lb. 1,150 mi. from San Diego to Kelly. The load included 10 R4350-41 engines and 16 of the 1940-diameter Hercules Standard propellers used by the B-36 and the XC-99.

In the first three months of evaluation the plane flew 350 mi. and demonstrated its ability to operate from remote single runways. It landed with a full load on a 5,900-ft. runway at McClellan AFB, Wash. It took off with a maximum payload (104,000 lb.) from a field with more than 5,000-ft. elevation. In one morning flight, the airplane lifted the complete ground equipment of a full tactical fighter wing from coast to coast.

XC-99 Data

Following are data for one month's operation (January, 1951) of the XC-99 USAF heavy cargo transport.

Number of cargo flights: 61
Hours flown: 672 hr. 13 min.
Total cargo carried: 1,123,000 lb.
Ton miles flown: 1,820,582
Air fuel load: 10,000 lb. cargo: 54 mi.
Air: max. hours to land: 16,000 lb. cargo: 9 hr. 35 min.
Air: max. hours to offload: 10,000 lb. cargo: 5 hr. 55 min.
Direct flight cost: 30.79 per ton mile.

New Loading Method—Finding the standard loading method for heavier transport, however, new techniques were worked out, including that of loading the airplane with its propellers in reverse pitch.

In the first six months of 1951, the plane performed other modifications: taking fuel tanks, leaving up more landing gear, replacement of the internal powerplant with a higher powered engine, installation of a self-heating system for upper deck loads and installation of a cargo elevator.

The transport returned to service last July under direction of Capt. Isaac M. Fennel, Jr., project officer, and a night try flight time limited by the engine over which had previously occurred the XC-99. The plane has been operating steadily on cargo runs since.

In April, pre-loaded cargo bins made at Kelly AFB were installed for small, high-density, loads presently planned to be placed on the top deck. Lower deck is reserved for larger items such as engines, which are loaded by cargo hoists or fork lifts in usual cargo position and tied down.

Fuel Loading—Experience with the pre-loaded bins has been so good that it is estimated that a 160,000-lb. capacity cargo plane designed originally for use with a fuel cargo load could be loaded fully in less than 30 min. Loading a single bin into the XC-99 takes less than 4 min. The deck will take 33 bins, each with a 4,400-lb. capacity. Loading time for the XC-99 is now a little over 1 hr.

Bins are hoisted to the airplane on a trolley, placed under loading hatch, moved by the aircraft's electric hoist, lowered into position and fastened down by tightening four bolts in the floor.

The XC-99 has a gross weight of 122,000 lb. fully loaded. Double-deck technique at 152 ft. high has 16,000 cu. ft. of cargo space. Payload even without a 20 ft. high, 14 ft. wide. With 33 4,400-gal. fuel tanks, the XC-99 has a range of over 8,000 mi. and an operational trip speed over 330 mph.

Standard flight crew includes eight pilot, co-pilot, two flight engineers, navigator, radio man and two systems. The latter are stationed on the lower deck in the aft section. No man operation of engines, flaps and landing gear, and report to the pilot, who cannot see them in a position from the flight deck. The 219-in. span wing is similar to that of the 300-in. B-36, as are powerplant gearbox installations. Lower-deck loading gear and most of the other cargo gear.

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AERONAUTICAL ENGINEERING



AERODYNAMIC CLEANNESS and structural efficiency are combined in Aero Design and Engineering Co.'s light transport, the Aero Commander.

Aero Commander: Study in Simple Design

Light transport's highwing gives it good stability and cockpit visibility, with cabin close to the ground.

The two-engine, highwing Aero Commander, now light transport new in full-scale production at the Tullahoma Airport factory of Aero Design and Engineering Co., is a general argument for simplicity in detailed design.

The Oklahoma City manufacturer's craft shows an amazing speed rate of better than 5 to 1—top speed is 217 mph and previous design speed is 40 mph, at least. And Ted A. Smith, Aero Design's general manager who spotted the original design of the Commander, credits the high performance to the reduction of weight by good detailed design.

From every aspect the appearance of the Aero Commander endorses the careful attention to design detail. From the leading edge forward into the door line, the contour of the nose, through the outward angulation system for better engine cooling, to the squared-off tail surface, the craft is a happy combination of modern-day elegance and structural efficiency.

► **Proven Efforts**—In 1944 Smith called together a group of ten other technical engineers and began the design studies that were to lead to the final configuration of the Aero Commander. By the end of 1945 they had reached a satisfactory final configuration and had worked out

performance data and the engine is installed. Tooling for the prototype was begun early in 1946, and, in August of that year, actual manufacturing was begun.

The first airplane was completed and test flown April 26, 1946. Behind bench and test bench was a total of 12,000 man-hours of engineering work shown on the Commander. Three design had been translated into tangible substance.

By 1945 was not a bright day for aircraft sales. The Aero Commander had a long and hard time of it in production. It was almost three years later before a factory was obtained in which to build the airplane. During that three years, another 10,000 man-hours were spent improving the design and getting it ready for production.

► **One-Year Record**—In January, 1951, the company acquired an empty hangar at Tullahoma Airport. Slightly more than one year later—in Jan. 30, 1951—the Aero Commander received an Approved Type Certificate from the Civil Aeronautics Administration. The first production airplane, which had flown the previous month, passed its CAA flight test in three weeks and one day.

Right now the first block of 50 production airplanes is moving through Aero's factory. The 100 employees are

now turning out the aircraft will have to be worked in order to meet the planned production schedule of two airplanes a week, says Aero Design. These first 50 airplanes are first orders, with cash deposits made to insure delivery promptly.

With production records available for demonstration to prospective purchasers, Aero Design expects the backlog of deposit orders to increase steadily. There are 15 aviation sales representatives here and abroad who will handle the distribution of the Commander.

► **Dispositions**—The Aero Commander is an all-metal aircraft which seats six people. It is equipped with flexible landing gear, and it is powered by two air-cooled engines on a wing with retractable landing gear.

The first thing you notice about the airplane is its highwing. Three years later, says the Aero Design engineering staff selected the highwing design.

► **Flight stability**. The company notes that the Aero Commander has no equalized stability on flight.

► **Cabin close to the ground** could be designed as passengers could step into it with ease. In the Aero Commander you step up onto the fuselage from the cabin.

► **Advantages of cockpit layout**. With the seat well forward in the wing, the pilot has a full view of vision, his position close to the ground makes the

Republic Designs Avionics Into New Jet

- Intercept missions will depend on electronics.
- But getting equipment in plane is a problem.

By Philip Klum

How does a fighter manufacturer feel as he evolves his aircraft from its size and weight to accommodate increasing numbers of black boxes of avionics equipment? What are his concerns as he tries the increasingly clear seas of his plane blanketed to extreme subsonic speeds?

A good place to observe the impact of avionics on the fighter plane manufacturer is at Republic Aviation. There only 11½ miles away, little avionics equipment, their F-44s are very much. But a new interceptor under design at Republic will be packed with more avionics equipment than any previous U.S. fighter—more than most World War II bombers.

• **Missiles' the Thing**—One might expect to hear the promise of such at Republic as they contemplate the prospect of avionics compensating their new interceptor design. But such is not the case.

To Republic, speed, rate of climb and ceiling, as themselves are not real objectives of a fighter as interceptor. The interceptors, they feel, must be designed and equipped to perform in combat missions accordingly. And they expect a new avionics intercept system to make their airplane a far more effective weapon than anything being today. The system is under design by a manufacturer (for security reasons) avionics manufacturer.

• **Missiles Only**—Unlike some avionics manufacturers, Republic is "trying to do it all," and not planning to develop, design, or produce avionics equipment.

In some other instances, like optical bombing, Republic has developed equipment or systems where the need, but no supplier, existed. But when the development was completed, Republic has turned it over to others to manufacture in order to concentrate on designing and building airplanes. This past policy has shaped present plans not to enter the avionics manufacturing field.

But if Republic doesn't want to de-



REPUBLIC F-44 typifies growing avionics complexity of new jet fighters.

velop or produce avionics equipment, it does want to get into the act to be sure that the avionics and airplane can be properly mated. That is still represented a modest departure from World War II practices.

• **F-47 Avionics**—The major avionics item on the Republic F-47 was its two-way communications equipment. The avionics and avionics manufacturers were cooperative designers. Republic was told only what was necessary and how much electrical power to provide for "black boxes" furnished by the Air Force. In some cases, the avionics equipment wasn't installed until after the plane had left Republic.

• **Today's Future**—Today all that is changed. Republic and the avionics manufacturer's engineers meet on an average of every three weeks to work out avionics/airframe problems connected with the proposed interceptor. This is significant because production of the plane is still sometime off. As the program nears production, the two

can troops will increase.

Why is such close integration required at this early stage?

The reason for the need will provide one answer. For optimum radar transmission, avionics engineers might like a least hemisphere-shaped radome in the plane's nose. But this would not mesh with the aerodynamics of the airplane. The pointed nose which a Republic interceptor might want would give the radar a bad case of obstructions.

Obviously good radar vision and airplane speed are both essential, so it's a matter of compromise. This in turn requires mutual education at both organizations so they will understand each other's problems. That is what Republic's electronics development group under G. E. White aims to prevent.

While and his small staff are electronics engineers bring in an aerodynamic streamliner. As a result, they can intercept aerodynamic problems in

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REPUBLIC F-44 typifies growing avionics complexity of new jet fighters.

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times which the systems manufacturer's engineers will understand. Similarly, they can explain antenna problems to Republic's avionic engineers.

► **No Square Pegs**—Until recently, an entire manufacturing track avionic equipment in whatever size and shape an avionic manufacturer provided. But not any more. Square has become only a fit for lighter aircraft because there's so much more avionic equipment and it is not compatible for space with fuel cells required for thrust engines.

No longer can avionic equipment be a square peg in a round hole. Rectangular shapes for avionic equipment waste valuable space in curved portions of the fuselage. The logical step is to shape avionic equipment to the fuselage contours—and that is just what is being done.

► **Dual Function**—Assigning the avionic engineers with antenna problems can emerge here to look an eye to space and weight saving of the equipment when needed. For example, the space required to mount an antenna device with vibration mounts may be 18% more than the size of the device itself in order to provide "mount space" and prevent adjacent devices from hitting one another.

If the entire wall is vibration mounted only because of special small "delicate" components within the unit, why not provide those components with their own internal vibration mount? The resulting chamber of external vibration mounts can save considerable volume space, according to White.

Similarly, he understands what environmental conditions must be met for the performance of avionic gear. The antenna designer can see to it that avionic equipment locations are compatible, not impractical choices.

► **Avionic Growth**—The rapid growth of avionic equipment aboard fighters in terms of size, weight, and power at quantities is considered any by a study analyst which Republic's White made several years ago. This predicted Republic's present interceptor design concept.

White's analysis included an F-105, an F-106, and a hypothetical plane equipped to fight and operate in all-weather conditions. The latter is comparable to the plane on which Republic is currently working.

White's study showed that an F-106 carried 1/3 more avionic weight than the F-105, and that the hypothetical all-weather plane would have 34% more avionic weight than the F-105. Square required for avionic equipment showed over 40% more growth.

But it was in the electrical power consumption of avionic equipment that growth was most pronounced. The F-106's avionic power consumption was almost three times that of the F-105,

while the systems manufacturer's engineers will understand, would use more than 7 times the power of the F-105. ► **Cloudy Crystal Ball**—Admitting that he had underestimated the amount of avionic equipment required for today's fighters, White says, "I think we're about 50% low." (This figure was a generalization because of varying considerations.)

A horizontal listing of some of the major avionic items in the interceptor shows why weight, size, and power at quantities have climbed so fast. Many of these have never before been used in fighter-type aircraft.

► **Intercept rate**

- Intercept computer
- Automatic pilot
- IFF (identification, friend or foe)
- IFF (identification, friend or foe)
- ADF (automatic direction finder)
- VOR navigation receiver
- ILS (instrument landing system)
- Radio altimeter
- Automatic engine controls
- Avionic Transfer-Avionic information of the effect of avionic on fighter-type aircraft is the requirement for fighter control of a power supply for energy and voltage. For example, the allowable frequency variation of $\pm 10\%$ on the old F-105 had to be cut to $\pm 5\%$ on the F-106. The new Republic

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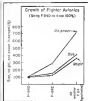
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STUNTING RISE in avionics requirements is seen in this comparison of the F-840, B, and proposed all-weather model.

plane must provide a.c. power with frequency variation of no more than $\pm 1\%$, or 100 hertz as close as is the F-84. A.c. voltage regulation is also being tightened.

► **Technical Manpower**—From growth calls as avionics engineers in the World War II, Republic has assembled a small group of engineers who work full or part time on White's staff. Probably this group will grow as the program moves along, but Republic doesn't expect it to mushroom.

Not at this stage can Republic estimate the increased number of man-hours technicians will need to install, test, or service the new plane's avionics equipment. Possibly the avionics contractor will station his own technicians at Republic to assist in installation and checkout.

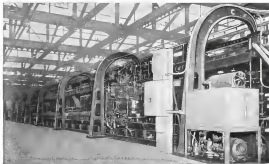
► **Costs**—Recognizing that they haven't yet felt the full impact of avionics, Republic officials nevertheless appear confident that there are no serious man-hour/avionics problems which slow down and a little go-ahead cannot fix.

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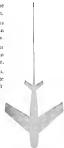
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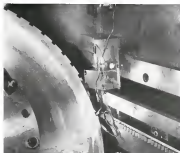
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What We Know About Titanium

Place in aviation seems assured for this strong, light, hard metal as working techniques are improved.

By P. G. DeHoff
and W. S. Hinchman*

Titanium, a competitive newcomer among metals, is carving a place for itself in the aviation field.

It has been an experimental jet engine and plane are being made for

its application in the newest models of production jets. Titanium has usually advantageous properties, but it is only the great amount of research and development completed on its technology in the last three years that make possible its choice today.

► **High Strength, Weight-Prize**—Titanium is in the forefront of the designers of aircraft and missile components in titanium and its alloys, the substantial weight used when it is used in place

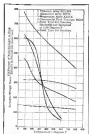
of steel and aluminum. It is obvious that titanium alloys weighing three times as much as steel and having the same strength reduce the weight of an engine part. It can also be seen in the accompanying graph why weight savings can be made, in many cases, by the substitution of titanium for aluminum and magnesium alloys, especially at temperatures above 1000°.

Conservatively pure titanium starts to lose some of its advantages over stainless steel around 2000°, but titanium alloys still hold a significant advantage up to at least 3000°. Above 3000°, however, the creep strength of titanium alloys available today starts to decrease, and in some applications limits their use.

Titanium also has advantages in addition to its strength weight ratio for jet engine parts. It is very resistant to the corrosive gases encountered in a jet engine. It is more resistant to salt air and water than 15% molybdenum steel, which is considered to be good in this respect. In fact, titanium is comparable to platinum in resistance to corrosion by salt air and water. Because many Westinghouse jet engines are used in carrier-based Navy aircraft, this corrosion resistance is of great importance.

Also, titaniums are plentiful in this country and could be readily available in an emergency. Use of titanium, furthermore, would save significant amounts of critical materials, such as chromium and nickel.

► **Problems Resolved**—Each component for which a titanium alloy is eligible presents problems basic to the use of any new metal and poses difficulties in manufacturing on a production scale. One of the greatest drawbacks to use of titanium and titanium alloys has been the almost complete lack of fundamental knowledge of the metallurgy of titanium. This is in no way surprising. Initially, there has not yet been time enough to develop the metallurgy fully. Little has been known of the structures of titanium and its alloys—how the variables in chemical composition, processing, and heat treatment affect the



TITANIUM alloy exceeds other common materials in strength/weight ratio.

structures and the properties. Besides how, better made in the past year based on understanding of these all important factors, but even research must yet be done before the understanding of a titanium compares with that of steel, aluminum, and other alloys.

► **Proving, Joining—Proving** was one of the first problems solved. The general procedure presented serious difficulties, but these have been effectively solved.

The one with which aircraft engineers were to be made with titanium was the early belief that there would be no joining problems. But this view quickly vanished. Although strong welds can be made with conservatively pure titanium by the plasma and arc-welding process, joint cost must be taken to prevent absorption of gases, which produce brittleness. Even weld-appliance techniques, welds in conservatively pure titanium are much less ductile than the parent metal. However, no base accident in developing techniques for making simple welds in conservatively pure metal. Most complex joints are being accomplished.

Welding of alloys of titanium is a more difficult matter. The main problem, aside from the undesirable effects of gas contamination, is the quenching of the weld during cooling from the welding temperature. Heat treatments designed to achieve the hard-oxid structure do not stand in the case of the overstructure produced by hot welding.

Thick butt welding presents hot welding of the material and has been applied to large parts for Westinghouse jet engines. Welds in being done on the thick butt welding of duct with promising results. We now have a technique for

Lyle C. Harvey, President of Affiliated Gas Equipment, Inc., says



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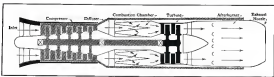


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PLACE FOR TITANIUM is indicated in the jet engine category. The cross-sectional section shows where the metal has been used or has been investigated—in compressor discs, compressor blades, compressor stators, bolts, compressor and turbine cases, and short metal parts. New alloys are expected to increase titanium's heat advantage over steel.

compressor stators, bolts, compressor and turbine cases, and short metal parts. New alloys are expected to increase titanium's heat advantage over steel.

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but solving these problems means work that improves the durability of titanium alloy parts.

Seals and bearings are an alternate method of joining that has its problems. The very fine and adherent oxide that gives titanium its corrosion resistance also offers the same resistance to flow. Seals and bearings and often have been investigated. Plastic liners and high temperature brazing alloys have been used, but the resulting part is brittle. Although some progress has been made, no completely satisfactory techniques have been devised.

Partly because of these joining problems, and partly because of design considerations, it was left to the early steps of titanium development that the most promising applications of titanium in jet engines was for integral compressor disks.

► **Machining.** One of the basic difficulties encountered in getting titanium into production was the development of machines and grinding techniques. Titanium alloys, particularly as they applied to machine tool wear is very rapid. Although these alloys are not extremely hard (about 295-321 HB), the abrasive particles of titanium nitride found in some alloys quickly cause tool break-down.

Another reason for tool wear is the increasing tendency towards a full titanium alloy. This causes bending and friction grinding of the tool edge. When the tool is dulled by these two factors, the machined surface is weak and hard and the machining problem is a serious one.

Although machining and grinding problems have been taught once to solve, we now have back and techniques by which titanium alloys are machined in production at costs comparable to those of stainless steel.

► **Tool life.** Tool life when machining titanium alloys is, as in other materials, dependent on cutting speed. The shear stresses of titanium alloys can be reduced by new methods of milling that keep the carbon content to a minimum, thereby eliminating most, if not all, of the very hard titanium carbides in the structure.

Early welding practices utilized a graphite crucible heated by induction. Although this technique permitted carbons pick up from the crucible, the contamination resulting from the use of other refractory materials was much more detrimental. With the widespread development of the arc melting process, using a water-cooled copper crucible and a graphite electrode, carbon contamination can be held close to a maximum of 0.25% as compared to up to 1% in the induction method product. Use of a tungsten electrode permits easily to be made with only a trace (0.075 percent) of carbon, but with some frag-

ility pickup, which is undesirable when it is in the structure as hard particles or shrapnel. New methods have recently been announced whereby even less contamination is allowed.

► **Carbide Tools.** The abrasive action of titanium can be reduced by the use of special hard grades of carbide tools for lath and boring and operations. These carbide alloys seem to resist tool break-down caused by the increasing action of titanium. The great ingenuity of carbide tool materials has led to a strategic design that allows carbide inserts. The bonding of these inserts grows in titanium alloy discs to very close tolerances is especially with high-speed steel because of rapid tool wear. With proper tool back and design the carbide-tipped inserts give proven wear satisfaction.

► **CO Coating.** Another new technique has been developed for the machining of titanium. This is the use of carbon dioxide as a coolant in place of oil or emulsion. Jets about 0.010 in. in diameter shoot streams of gas directly at the tool-work interface. This gives much better cooling than is possible by the usual methods. The aqueous coolant action helps prevent tool break-down not only by protecting once heating of the tool edge, but also by reducing the cooling tendency of the titanium.

Carbon dioxide has another great advantage in the machining of titanium. Because the metal is so expensive, it is imperative that all possible scrap be saved and reformed. The amount of scrap at the ends of forgings produced in the manufacture of a compressor disk

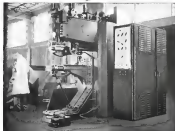


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weighs more than the finished part. In order to be machined, this scrap must be almost classically clean, or the superalloy will cause difficulties in the finished material. Even the glass and cedar left on turbine produced with a water soluble cutting fluid cannot be sufficiently removed to permit this scrap to be machined satisfactorily.

But scrap produced during machining with carbon dioxide as a coolant and clean and excellent for recycling.

Grinding—Another operation involved in the manufacture of titanium-alloy compressor disks destined to count trouble on a production basis. This was an automatic grinding operation that had to hold dimensions to extremely close tolerances (within 0.002 in.). The titanium wore the grinding wheels so fast that automatic operation was impossible. More reason for this rapid wheel wear was probably associated with the wearing tendency of titanium, because wheels hard enough to hold their shape ground away quickly. But a systematic study of wheel abrasives, loads and grit size, coolant and wheel speeds has resulted in suitable technique.

The result of all this effort seems that a completely new material is available for the designers of Westinghouse jets. There are many problems yet to be solved, but we are finally convinced that titanium has a large place among our structural metals.

**USAF Offers
Surplus Tools**

Military Air Procurement District, Chicago, has set auctions out to up approximately 1,000 items ranging from tool to tool on 10 machine tools that have been rejected by various government agencies.

The selection includes gear graders, boring machines, chip breakers, lathes, screw machines, presses, milling machines and threaders. Selected parties may inspect the machines at Government Plant No. 1, O'Hare AFB, Omaha, during June 2-6.

Arrangements to visit the site can be made through Philip C. Hays, Veterans Co., O'Hare AFB. Bids will be opened publicly in Chicago on June 16 and the winners can pick up their selections within 45-60 days.

Missile Group Expands

Union Steel Co. is expanding its recently formed Aircraft and Guided Missile Division, E. Lee, Kentucky, by 320,000 sq. ft., bringing its total to 580,000 sq. ft. Plant operations at high precision jets and turbine tooling for wing, tail, landing and other aircraft sections, including design, fabrication and final assembly in company's plant.

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CAB Accident Investigation Report

THE ACCIDENT

Received Aug. 21, 1987

HISTORY OF THE PLACENT

Throughout the entire fight the captain and co-pilot alternated flying the aircraft, and the last portion of the fight from the vicinity of Vero Beach, Fla., to Miami was flown by the co-pilot. Captain McDonough was seated in the left pilot's seat (or second place in the cockpit) and was performing the usual cockpit duties.

At approximately 628 feet above the ground the co-pilot asked for full flap. This was done and the aircraft was observed to approach the airport in a normal manner with the landing gear extended. When approximately 250 feet past the approach end of the runway a normal landing was made on the stress landing gear wheels. The aircraft was then seen to taxi a considerable

The Moon position at the time of the accident was rising, altitude 11 miles, wind with southwest three miles per hour.

INVESTIGATION

Upon arrival at the field's investigation, a complete series of videotape controls, switches and hydraulic pressure gauge indications were made. It was found that all switches, including the pressure generator and leveling switches, were in the OFF position and the hydraulic pressure gauge was in the null position. The main auxiliary bell and the bell once fired were off and the hydraulic fluid lay free and head pump solenoid valves were closed. The hydraulic pressure gauges registered a normal 1,200 psi and the hydraulic pressure generator was set at 1,200 psi. Other controls were positioned as follows: out flap closed, in flap closed, pressure controls full forward, flap indicator and flap bell full down, landing gear front down and the landing gear indicator full down, flap indicator full down, flap indicator flap gear warning light red with at the light constant. An internal connection of the aircraft revealed the flaps to be in the full down position and body damaged by contact with the runway.

In order to determine the extent of damage and to examine the loading post, the aircraft was raised. It was found that the nose gear doors were damaged by contact with the runway, however, the nose gear itself was undamaged. When allowed to fall free, the lower gear collapsed to the full down position and locked. Examination of the main landing gear declared that the winging cylinders (six of each pair) of each strut were bent approximately 90 degrees. These rods had retracted approximately five inches into their respective cylinders and were bent at a point where they emerged from the packing ring. The lower ends of each rod were also bent a few degrees. The lower

If It Helps You...

Publication of this official Civil Aeronautics Board report on an airline accident helps to light a type of aviation information which is seldom revealed in full detail. If such reports help you we shall continue to publish them in as much detail as space permits. Your comments would be appreciated. Write: The Editor, Aviation Week, 380 W. 42 St., New York 36, N. Y.

hydraulic fluid reservoir was examined and it contained a minimal amount of fluid.

The damaged retarding web and drag links were then replaced by similar new parts of correct lengths and tolerances and the gear was again tested under pressure. All three landing gear functions in a normal manner. During this test the gear was given light for the right landing gear did not operate, however, it was found that the main switch operating arm for this light had been broken by impact and master fuses prevent the light functioned in a normal manner. The hydraulic system from the landing gear selector valve to the ailerons was checked. No

disturbance was allowed and the concrete filter was clean. The fluid was drained from the reservoir and, strikingly, no foreign matter was found. The two engine driven hydraulic pumps were removed and tested and found to function in a normal manner. The leading gear wearing item operated normally, however, the fluid had to be in the nearly closed position, to actuate the beam.

The aircraft's maintenance records were reviewed and three indicated that annual inspections and maintenance had been performed. All certification documents had been completed with.

The crew stated that the approach and the landing were made in the usual manner, that after the landing gear contact there was placed in the down position prior to landing it was not noticed from that position, and also, that the landing gear warning horn did not sound at any time.

ASAC/SPF

Since trials are subsequent to the accident data, it is clear that the shore's landing gear mechanism and hydraulic system was capable of functioning in a normal manner, it is necessary to analyze the system to determine what could cause the gear to extend and retract. The landing gear is a strut type, with the main landing gear extended by raising the landing gear control lever, located on the pilot's cockpit, to the DOWN position. This mechanically actuates the landing gear to extend, possibly hydraulic pressure is applied to the oleo to extend the oleo. The oleo is the fluid in the cylinder in the oleo is allowed to return to the nacelle. When landing gear struts extend and retract, and the system pressure is released, the oleo is allowed to return to the nacelle. The oleo, green lights come on and the red warning light goes out. The landing gear is then held in the extended position by the down oleo and the system pressure which is applied to the oleo. The landing gear is retracted by moving the landing gear control lever to the UP position. The hydraulic fluid in the oleo is then trapped by means of a check valve in the port of the control valve and

Should lockwire presence be unacceptable, the landing gear would extend and lock by its own weight by operating the control lever to the DOWN position. The design of the main landing gear is such that the weight of the aircraft will hold the gear in the extended and locked position. With the entire weight of the aircraft on the gear, the application of full system pressure applied to the up-latches will not retract the gear.

The seat gun shows both a seat belt by a rapid-blowing hydrobag and a booster cushion. To attach the seat, a tie-down passes over each side of the back of the spring. With the weight of the children on the seat, tie-down pressure in excess of 2,000 psi is required to unhook and retract the seat gun. When the weight of the occupant is on the loading gun and the right main loading gun, the clutch that has been compressed, a safety switch activates and engages the loading gun, stretched back control lever. When the seat is attached, it engages the loading gun control lever, a locked in the 1000000 psi.

Since the crew stated that they observed the guns waving before to be on and then when subsequently fired the heading

gas mechanisms functioned properly. It can be assumed that at that time the gas was blown out behind. From the three level samples of the leading gas, specimens A and B, the density, viscosity, and conditions (dew point, pressure) were determined and compared to serve. Although the crew stated that the leading gas control lever was placed in the fully down position and was not moved again, it is possible that the lever was inadvertently moved upward instead of the day control lever after landing. This may have occurred when wing lift was still present and there was insufficient weight on the landing gear strut to actuate the leading gas control lever safety latch. This is substantiated by the manner in which the strutting cylinder was never manually actuated.

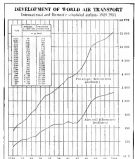
RESULTS

- On the basis of all available evidence the Board finds that:
1. The crown, the crew and the aircraft were properly certificated.
2. The aircraft was sitting in the right pilot's seat and was flying the circuit.
3. The flight was cleared to enter the Moscow traffic pattern and landing gear was lowered.
4. Following the lowering of the landing gear, the props were being fully cranked on, indicating the gear was fully extended and locked; however, it was not.
5. A manual landing was effected and during the landing roll the engine landing gear retracted.
6. The landing gear had a limited capacity of functioning in normal mode when it failed after the accident.

PROCESSES CAUSE

The Board determines that the probable cause of this accident was the inadvertent moving of the loading gate control lever upward during the loading call, causing the loading gate to operate.

THE CIVIL AIRCRAFT BOARD



Yale:—Cranio not drawn in a leptotheca mode. Each horn incl. 1/2 the preopercle; 1/2 twice nearly double that for the next two below it.

Produced by CHS, all years January 1911 to 1912, Japan, 11-6 to 1912 CHS 10-6 to 12-1

SOURCE: EPA. *Asbestos: Health Effects*



Collins 17L VHF
aircraft radio
transceiver

NOW! Full use of VHF radio by owners of executive aircraft

Collins' "non-critical" plan is no longer confined to VHF frequencies of 121.1-122.9 megacycles for air-to-ground radio communications. By action of the Federal Aviation Administration's General Aviation Division, the FCC has enabled all owners of aircraft regardless of type to utilize certain frequencies within the band 118.1-126.7 megacycles.

Not only that! Under the new Controlled Music rule Plan we are now authorized to use priority DOD-6 to get materials work which no full owner from corporate plane owners for Collins 17L transmitters.

The businessman can now equip himself to operate in the same way under maximum conditions as the scheduled airline.

The Collins 17L transceiver provides transmitting facilities on all channels reserved for aircraft

communication in the VHF band. Its frequency range is 118.0-126.0 megacycles, and all of the 180 channels assigned in this range are easily selectable over a simple and positive control control system. The power output on voice is conservatively rated at eight watts. With this power, and the greatly increased number of frequencies now available, the pilot is assured that transmissions will be received and answered in the business environment.

The 17L is a companion to the 54R navigation receiver with which many executive planes are already equipped. The pair provides reliable two-way radio communications.

We will be glad to send you a more complete description of the 17L transmitter on request.



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EQUIPMENT



SLOTTED STRIP keeps air from hitting prop blade fully, eliminates noise.

How Anti-Zoom Prop Reduces Noise

Details of a new-casting "anti-zoom" propeller have been released by Eddie La Tulippe, former chief engineer of Aero-Sonic Corp., Reading, and developer of an engine muffler recently demonstrated on a Matco Autotest 6-46 American Waco Pilatus, p. 30. La Tulippe has light tested the device in his 450 hp Howard cubic plane and hopes to have one soon for larger planes.

• **Noise Killer**—La Tulippe states that in striking the blade fully in all speed ranges is responsible for the annoying noise from propellers. His blades can flex forward to a 60-deg. angle and can turn, changing their pitch, so that each vibration wave is dampened. Thus are the prop's special features.

• **Forward-cambering blades** reduce vibration. Static thrust when the plane is backed up to takeoff and cruise blades in moving forward so that they look something like the ribs of an airplane nacelle. After the plane starts moving, the blades gradually assume their position 90-deg. to the prop shaft.

By hitting the blades using the two or three points on the hub, vibration and blade flexing are greatly minimized, La Tulippe says, and prop efficiency is improved. Takeoff run is reduced.

• **Pitch** is controlled by blade using two red air measuring cones the blades to turn, though giving in the hub, thus changing pitch. When blades

swing full forward they also turn to takeoff pitch. When they swing back, to normal, they automatically turn to cruise pitch. They can be adjusted on the ground for any desired cruise pitch.

• **Slotted strip** on leading edge of blade forces air to it does not strain blade fully or at corner-pulling angle.

• **Efficient Turn**—The present prop is a Thompson Standard ground-adjustable type formerly used on the old Ford Tri-Motors. It is a crude affair, La Tulippe states, with no feathering and with the desired strip bent behind to the conventional blades. But the finished product would have the strip integral with the blade, and the hinge points, springs, etc., now exposed, would be based on the hub.

In 119-hp "cruiser" test at Wright Patterson AFB, the instrument could be picked up prop vibration stood virtually still, indicating the new propeller's effectiveness, La Tulippe says. La Tulippe told Aero-Sonic Works, Inc. work he had left Aero-Sonic and plans to continue propeller and aircraft muffler research in vice president and chief engineer of E. J. & Associates Corp., Englewood, N. J.

New Dye Process Speeds Inspection

Tetra Products, Inc. has introduced a new dye inspection process, "Chick-Spot," designed to bond borboric acid and rapidly move large quantities of water through battery inspection compartments.

It represents the firm's Dy/Check process, but as it is engineered around plant procedures, Chick-Spotting depends on battery composition for effectiveness, while Dy/Check is a self-referencing "portable" process. High voltage is the keynote for Chick-Spot, "brushing" observations Dy/Check, Tetra says.

Chemicals in both processes can be applied by spraying, pouring or dipping. Cost of equipment is fraction of that for other inspection methods, Tetra says. Both Chick-Spot and Dy/Check avoid the use of a penetrating red dye applied, then removed from the metal surface, leaving an invisible residue in the cracks. This residue is drawn out of the cracks by a white developer, providing a sharp contrast for the white and markings which appear, clearly debarking and magnifying otherwise invisible cracks in the metal structure.

Tetra Products, Inc., 512 E. 62 St., Los Angeles 1, Calif.



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(See inside page)



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NEW AVIATION PRODUCTS



Rocket Air Control

A new air pressure regulator designed to feed a precise air supply to flight instruments, radio systems, rocket fuel tanks and similar airborne installations, has been announced by Wallace D. Leonard, Inc.

The regulator has down which varying air inlet supplies into a second, high-accuracy delivery, its outlet tap. It can, for example, take fluctuating high-pressure air tapped from the jet engine compressor when varying, vary where from 5 psig to 175 psig—and give it down to a constant delivery of 1 psig, accurate to 1.0 in. H₂O, Leonard claims. Vacuum valve models are available. The one with the performance described above meets Spec MIL-V-1810.

The regulator is two-stage, direct-acting type and can be supplied in pressure differential or absolute pressure construction.

Wallace D. Leonard, Inc. 573 S. Fair Oaks Ave., Pasadena 1, Calif.



Avionic Couplings

A new type of lightweight electrical connector, designed to meet certain temperature, corrosion and vibration problems that can't be solved by other types, according to its maker, has been

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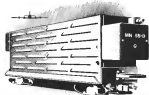
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The driven gear shown here is 37" in pitch diameter and 137" long overall. It is underlaid and hardened with heat treating distortion held within .0001".

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placed on the market by Tiedies, Inc. Suitable for AN applications, the connectors are designed to eliminate change, save space, facilitate fastest assembly and permit easy changes in wiring arrangements. Terminals can be removed from the connector block to allow or crimp the wire to the end of the terminal, eliminating the difficulty of making a connection in the confined space of the connector shell.

Only this connector geometry provides the needed high altitude and all-weather performance to meet serious equipment demands now arising in the aircraft field, Tiedies asserts.

The connector conforms to AN spec 8 through 36 and can be furnished for cord connectors, shielded assemblies and bulkhead or box mounting.

Tiedies, Inc., 520 Parkwayside Ave., Newark 3, N. J.

Jet Engine Carton

A new shipping container for jet engines which is 50% lighter in weight than present types has been developed under Air Force contract by Boeing Industries Corp.

The container is made of Fiberglas impregnated with polyvinyl resin, providing a tough, hard panel surface. The engine is supported within the unit by special shock absorbers of the con-

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The B-47, vital to America's defense plan, is just one of the challenging projects Boeing engineers are at work on. Others are guided missiles, rocket motors, and the B-47 Stratojet, now in quantity production.

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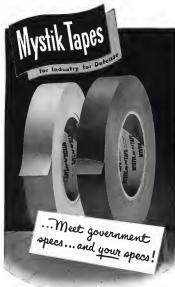
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play's own make. The prototype is locked by metal clamps. It measures 22 ft in length, about 5 ft in diameter. Basso says the production model will differ considerably from the prototype and will be lighter in weight. No metal bands will be used. Instead, ribs will be welded right into the casement with bolts so that the entire nacelle will be only 5 lb the weight of metal casements used now. The plane was formed by a vacuum molding process. Basso Industries Corp., 3412 W. Forest Rd., Bronx 68, N. Y.

Nacelle Latch

New latches for aircraft power jacks and engine nacelles are being marketed by Hartford Aviation Supply Co.

The latches can stand up to 12,000 lb static tension and are available in straight, offset or corner types. They are designed to fit flush with the surface they are installed on. After the toggle mechanism locks in place, the applied load holds the latch closed. It is opened by depressing the flush handle (a tool bolt and trigger arrangement).

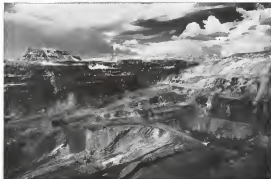
Hartford Aviation Supply Co., 9015 Venice Blvd., Los Angeles 34.

ALSO ON THE MARKET

Makes positive corrosion inhibitor is claimed to protect iron and non-ferrous metals indefinitely once it is applied. Matronal can be added to paint and gasoline. Several government aircraft bases are testing it, use develops. Phillips Scientific Laboratories, North Arlington, N. J.

Heat-activated rubber made by B. F. Goodrich is oil and chemical-resistant anding material for valves used in high-temperature heat-treating systems. It is resistant to deterioration and abrasion, has positive vapor sealing qualities. It is being used in a fast-heating valve developed by Atwood and Merrill Co., Salem, Mass.

Boiler tracking cloth for engineering drafting work has a "super-velvet" pencil writing surface, provides clean lines, accuracy, better drawing surface and greater durability than previous tracing papers, according to developers, Charles Branning Co., Inc., Veterans, N. J.



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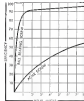
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The Seginaw Ball Bearing Screw and Nut is the most efficient known method of converting rotary to a linear motion. Almost friction-free, this device—of far greater efficiency than the Acme screw—is widely used in aircraft actuators.

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WHITE TODAY for the new booklet that gives full details and engineering data on the full bearing series and, in principle, Imperial Drawing Gary Greene, General Sales Representative, Imperial, Allentown.

995 PRODUCTS
STERNING GEAR RISE/LOWERS
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come check valves for 1,500 and 1,600 psi, service can be obtained from Fisher Aircraft Co., Los Angeles. Complete wiring on line of single, double and triple action master/slave pistons, having clutch, brake and other master drive components below the floor is available from Densly Markham Specialties, Inc., 2100 So. LaSalle Ave., Chicago 90, Ill.

Detached from aircraft cable, *terracotta* and *ceramic* may be the best ideas. Mawhite Co., Kenosha, Wis., has a line for Catalog 24. *Colorfast soliding* (impregnating) Catalog 20C gives more information on Vetro. *Waterproofing* Vetro Equipment Co., Wichita, Kan., has a manual, \$34.50. Volcanic, San Francisco 7, Calif., *Volcanic Insulation* gives properties, performance and detailed application data necessary for those negative temperature coefficient insulation needs interfacing their seal and electrical behavior. Write Key Stone Carbons Co., which is located in St. Marys, Pa.

Publications Received

• **The Asiaplane Directory of British Airlines**, 1992 edition, compiled by the Staff of The Asiaplane, published by Temple Press Ltd, Bowling Green Lane, London, E C 1, 15 shillings. A complete guide to aviation throughout the British Empire, as it was, countries, corporations, air lines, industries, living clubs and so on, together with a geographical section contains over 1,500 entries.

Engines and Ivory Towers, by Hardy Goss, edited and arranged by Robert C. Goss, publisher, McGraw-Hill Book Co., Inc., 110 West 41 St., New York 36 N. Y., 1932, \$1.00. A discussion on the relationship of engines and engineering to science and the humanities. It focuses on a wide range of subjects, including education, graduate study, the application of research theories, and the responsibilities and obligations of engineers.



Theresa M. Amabile, Harvard Business School

LETTERS

One-Mono Interest

My all-around one sheet, composition by AVANISH WILK and David Andriano in his excellent discussion of our One Sheet song competition Apr. 21. Mr. Andriano has demonstrated a keen appreciation of the songwriting principles involved and a refreshing grasp of all guitarists with respect to second performance in the subsequent sessions.

In view of the whole as today, more (Aps 28) "health" of Clark Spence New Safety Plan "we know, you will be pleased to know of the utmost care of the workers and manufacturers is, more desirous toward the construction."

Some two days we sailed out of the harbor, scheduled arrivals and the broken transport manufacturers to remember Don Vito as a possible solution to some of the problems in security design. Special emphasis was placed upon two features which Mr. Vito had subsequently agreed—resistance to stall and comparatively low landing speeds through gusty air—two features that were not.

Ye date. The engineering departments of steel mills are studying it and two of the major manufacturers are calling for additional data which is now being prepared.

You want to escape closer to solution of the problem (low landing speed) than working we have at now . . . We want

We are confident that the Duo5400 principle is destined to make a very definite contribution not only to safety on an international level but to aircraft performance and utility as well.

CLAYTON E. BLANKEN
Field Development Corp.
120 Park Ave.
New York, N.Y. 10020

So. Pac. Complains

We were pleased to send a team Feb. 21 since George Chertman's returning was due about the California Coastal Aqueduct and thought you would welcome having some latest related information relayed to the companies the article made of from between San Francisco and Los Angeles. We consider this company quite the leader.

The railroad is made that there is fast between San Francisco and Los Angeles a \$81.50 while San Fran. is \$33.50.

The last fare of \$115.50 is used primarily for interstate bus purposes and Southern Pacific's primary traveling between these California points on the comparative road paper from Chicago coach passengers now including the Del Norte excursion have long enjoyed a lower fare. The one we found much less between San Fran and Oakland and Los Angeles is \$7.50 plus a 14 percent surcharge. On the same point "Del" on which there is no or great was chosen the total coach fare is



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United Negotiating Purchase of DC-7s

United Air Lines is negotiating to buy 25 Douglas DC-7s and has ordered 30 more C-54s. Total cost of the first acquisition is \$55 million—\$30 million for DC-7s and \$25 million for C-54s.

United's new planes did not speedily curtail the type four-engine transport it is using, which led to speculation the company was to consider modifications to the basic DC-7. However, Douglas Aircraft is reported among United to stock with the basic design already ordered by American, National and Delta.

UAL, presently had ordered 15 DC-7s, but at least 15 DC-7s (Aircraft News, May 16, p. 3).

The 10 new C-54s will bring United's 140 fleet to 58.

Puerto Rico Field

(McGraw-Hill World News)

San Juan—U.S. Navy has ordered Vespene Airport, which is built here, for use by military aircraft including private planes. Airlines and individuals using the field must insure aircraft against loss to the Navy.

An auxiliary runway, one built 11, Vespene is under construction.

Alaskan Nonsked Wins Libel Suit

Golden North America, Inc., Alaskan non-scheduled airline, has been awarded \$25,000 judgment against the Fairbanks

News-Miner in a libel suit brought after the newspaper attacked non-scheduled Golden North and an editorial in the newspaper intended to depress the airline of the "benefits of public confidence, support and esteem and to raise its self-esteem and its position as a fully certified non-scheduled air carrier." The company asked \$38,000 damages, but the District Court cut the figure in half.

ANA Sets New Cargo Gains

American National Airways has reported another big gain in freight traffic—its 1951 figures show its freight went up 15 million lb. over the previous year to set a new high of 72,725,533 lb.

Among these freight haulers and freight DC-7s on a round-the-clock basis. ANA's monthly freight receipts were 1951: Jan. 7 million lb.; Feb. 7 million lb.; Mar. 7 million lb.; Apr. 7 million lb.; May 7 million lb.; Jun. 7 million lb.; Jul. 7 million lb.; Aug. 7 million lb.; Sep. 7 million lb.; Oct. 7 million lb.; Nov. 7 million lb.; Dec. 7 million lb.

CPA Cargo Plans

When Canadian Pacific Airlines gets its new DC-4s and five DH Constellation, the carrier will begin development of trans-Pacific freight service to Japan, Hong Kong and Australia. Canadian Pacific Airline President W. A. McLeod stated at an annual meeting in Montreal recently.

Put Your Scap Back to Work



NEW PLANES MEAN NEW RUSES

Boeing Constellation has taken delivery on the first of 30 new 37 seat Constellation to replace its present 15-seat vehicles for transporting passengers to and from the two main London airports. Boeing reported it is necessary to arrive before Airport Authority Transport BEA is pulling into

service. The new Constellation will be approximately 38 ft. long, 8 ft. wide and 32 ft. high. It includes a large baggage compartment at the rear of the body decorated by tail-lighted signals at taking 180 full-ton payloads. The storage space is no deep concern and is loaded with rubber.

SHORTLINES

► **Air Coach Transport Assn.** says modern fleet from 1951, 15,000 passenger miles in 1951 compared with 70,000,000 in 1950 and 145,000,000 in 1949. New deal business in 1951 totaled \$62 million. ACTA did \$2,000,000 of official military traffic business the month to the May 31, but continued to be a loss.

► **Air Line Pilot Assn.** endorsement of former President David Beland and election of President Clarence Sousa was held and orderly, the U.S. District Court in Chicago is advised by master of ceremony.

► **Air Transport Assn.** awards for airline employee research in 1951, go to S. M. Sanderson, PAA, \$750 (air station), Ralph Merkle, Jr., AA, \$150 (freight), and Charles Unger, AA, \$200 (bag).

► **American Air Transport and Flight School, Inc.** will have 15 letter of acceptance received of CAB adopts the recommendation of its advisory.

► **American Airlines** traffic is "generally excellent," Vice President and Treasurer W. J. Hagan told stockholders May 28. Expenses are still rising but slower than before. Second quarter earnings depend on how long the fuel shortage lasts.

► **California Coastal Airlines** set a new traffic record in April, carrying 15,411 passengers—up 74% from a year ago. Load factor was 80%. Former record was December with 15,707 passengers.

► **Coastal Airlines** reports April load factor of 21%, carrying 5,194 passengers. Flying load was 17%.

► **Flying Tiger Line** April scheduled air freight revenues of \$451,000 are 23% over a year ago. January-April total \$1,147,000. These figures don't include military or commercial contract operations or outside maintenance.

► **Los Angeles Airlines** operating expense this March was up to \$1.42 per register mile, compared with \$1.05 a year ago. Register miles flown were down to 21,719 compared with 31,817 in March, 1951.

► **Mid-West Airlines** closed operations May 15. CAB had denied its certificate renewal application, effective July 1. Eastern Research, Pasadena, recently bought the airline for \$68,000 with CAB approval.

► **Northwest Airlines** assembly stockholders who voted against merging with Constair Airlines are being checked by CAB to see if any of them had divided interests due to interlocking directorships.

► **Pan American World Airways'** third all-cargo DC-6A was scheduled for delivery April, June and July of 1951. PanAm has been chartering a 512 DC-6A recently.

► **Pan American-Guest Airways** has started flying new DC-6A on its New York-Boston-Airport service, month 1951 to either South American

cost with stop-over privileges. His initial two new DC-6As for delivery February and March, 1951.

► **Transocean Airlines** is flying two Transocean all-cargo flights a week for Southwestern Airlines System, N.Y.-Cape Canaveral.

► **U.S. Weather Bureau** installation of two more wind spotting radios at Goodland and Dodge City, Kan., under 15 tests in the Bureau tests in about 10 a year, using weather equipment and spare ship logs. When taking these stations get practice around local storm centers.

Prompt Shipment STEEL

Call your nearby Ryerson plant for any steel requirement—standard or aircraft analysis. Though some items require in short supply, our stocks of carbon, alloy and stainless steels are large and diversified.



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R-2800's
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These engines are 50 HP above C.A.A. approved standard and have had A.C.E.S. approved overhaul in laboratory engine room to exacting specifications. They have also been checked in our engine test cells and have been prepared for easy test changes.

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LOCKHEED 12A - SERIAL NUMBER 1280

TOTAL HOURS TO MAY 1, 1952

AIRFRAME — YR. 4,410, ST. above 5,000 Overhaul — 225 hrs.

TE above 10,000 (March 17, 1952) — 10 hrs.

ENGINE — R-2800 12A, 1,175 hrs. since overhaul

PROPELLER — Same overhaul 221 hrs.

EQUIPPED WITH

Hydraulic Reversible Tail Section Equipment.

Whitcomb Warner Propeller Feeding System.

Four Cartridge Oxygen Capacity (367 cu ft)

RADIO EQUIPMENT

R-2F — VME — 100 in. Power

Executive Intercom — 1 Speaker, 5 Control, Voice Command

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Sperry A-12 Auto Pilot with

Automatic Approach Control

R-2800—very good condition (later in

cluding engine overhaul, 1 electric, alarm,

dash, but case, including radio, engine, and

including Outfit, 1000 Sigsbee, 1000

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IMPORTANT! Many items in this group have not been listed in previous ads!

One of America's largest stocks of UNUSED

AIRCRAFT PARTS

We own and offer all parts listed — plus many thousands more — stored in our Baltimore warehouse!

43 PIECES

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Associated to be

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General auto—auto—auto

Associated, etc.

750 OXYGEN and CO. CYLINDERS

Widened Alloy Wire 1001

General auto—auto—auto

Associated, etc.

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MISCELLANEOUS COMPONENTS

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100	1000-2	1000	1000-2
100	1000-3	1000	1000-3
100	1000-4	1000	1000-4
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100	1000-6	1000	1000-6
100	1000-7	1000	1000-7
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No Overconfidence, Gentlemen!

Note to readers:
No editorial office on aviation conditions in CAA's Office of Aviation Safety. We do thank you CAA members who have written this past week, however, noting all over sufficiency. We have some material in preparation, and more objectives.
In the meantime, Mr. Hensley, don't get overconfident.

Sawyer's Red Herring?

Commerce Secretary Sawyer has come out for letting standards firms and outside own advice. Like to many other Treasury administration outposts, this is a bit puzzling, and badly timed.

The best Washington information we can find indicates that his never been a time in recent years when surface comes almost to an transportation has been so demanding—if not dead.

Mr. Sawyer should have checked first with the Transportation Association of America. This national industry group, so heavily weighted with self representation, is not to miss a report saying there would be no advantage in letting down the bar to surface reform.

Aviation has enough on its agenda these days, with our having to worry about airports and airports from Washington, especially from the Big White Father of the Civil Aeronautics Administration, its agency seems to promote the best interests of aviation. Or his Chief Sawyer forgets that CAA is part of the big bureaucratic system?

Saving New Ideas

What is so hard to sell as a new idea?
Aviation's growth has been fantastic. The public thinks of it as dynamic, vibrant, burgeoning. Right. But even so aviation the new idea battles for existence, and the bigger and more costly aviation becomes, the more change and progress costs.

So one of the problems of aviation's fast growth has been a spreading antagonism among its busy leaders, who are too harassed or too poorly advised, or too little heard, or too uncooperative, to give themselves to a new idea.

Recent aviation history is full of examples, and we think of the job of anyone with a healthy dissatisfaction with aviation's progress—as good as it has been—so tick off a few. Some aviation people are coming frankly close to becoming stuffed shirts and very complacent about things. Nothing could be worse for aviation. We need new ideas.

They are our best insurance of progress. The vast possibilities of the helicopter were written all over the face of the future, for those who would see. But it took a Korea war and its terrible consequences to bring real military acceptance to the helicopter. Now the industry can't wait enough to study the war.

The history of the country's place in the earliest development of the jet powerplant is nothing to boast

about, despite our railroads and railroads of dollars appropriated for aviation. We are still about seven years behind the British in commercial jet transports. Who can say this won't become right or true in ten years?

For months and months an influential, pioneering group of individuals has been lighting the Washington battles on aviation, resistance, and confusion to sell a radically new idea in itself, medium-speed piston planes offering amazing performance characteristics, and holding an encouraging outlook for both military and commercial uses. Neither military nor commercial groups have enough interest to give the little ship a chance in these days of billion dollar appropriations.

The cause of the contemporary was indicated in some very high government places until recently.

The whole approach was in still important to some heavy-headed surface presidents who, not against the new ideas because they were so "inferior" as to have nearly a million cash customers—many of them new first rides—in the years 1933 and 1951. Even yet, most of the certificated carriers who have cash services are relating to promote and advertise them to the last because they are afraid these heavy services will be lost.

The idea that air cargo business could be created and sold at unprecedented low rates, and open a tremendous new market to aviation, was literally stuffed down the Civil Aeronautics Board's throat after years of effort by a few pioneers, some of whom were unable to hold on till the certificates were doled out. The Board is still notoriously blind to air cargo, as witness its recent refusal to grant Seaboard & Western—or any other all-cargo carrier—a trans-Atlantic certificate, even after Seaboard's remarkably efficient record.

For years the Pacific airlines have been working up a little-recognized principle of aerodynamics which its leaders feel may revolutionize some aspects of flying. Maybe it will, maybe not. But those who showed even a respectable and public interest up until recently were a small number indeed.

The idea of a light safety foundation, proposed for years by Jerome Lederer, was discussed minutely by safety people for a long time before non-aviation men an adequate number of contributions were available to justify a start.

Aviation West has tried to buck some of these "radical" ideas editorially in its short five years. There are others that need support. There always will be.

How can we in aviation take steps to improve our cause? How can we encourage these new ideas that come out of the garage, the back yard, the side street shops, the university classrooms and laboratories? How can we help these nervous doubts around the laboratories of Washington and the complexity of business?

Aviation leaders, in busy as they are with routine daily problems, probably cannot be expected soon to change their attitude that too many new ideas are bothersome. Perhaps what we need is our own Ford Foundation that will give sober, considered attention to new ideas, and money to those that seem worth developing.

—Robert H. Wood

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You can get from Harvey's field engineers. They are ready to assist you with technical design data and recommendations for the efficient use of aluminum extrusions—to help you take advantage of the inherent design flexibility of extrusions—to add strength, reduce weight, improve appearance, simplify assembly and lower your production costs.



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Here is another striking demonstration that, when Allison Turbo-Prop engines replace reciprocating engines, higher power and better aircraft performance inevitably result. Today America has four leading airplanes* flying with Turbo-Prop engines—all of them powered with Allison T38 or T40 Turbo-Prop engines.

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Builders of J35 Axial, J33 Centrifugal
Flow Turbo-Jet Engines, T38 and T40
Turbo-Prop Engines